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(71) Applicants

Hibbing Limited, 147

Connaught Avenue,

Frinton-on-Sea, Essex,

David Sydney Snook, 33

Shepherds Pool Road,

Sutton Coldfield, West

Midlands

(72) Inventors

Andrew John Skilling,

David Sydney Snook

(74) Agents

Sanderson & Co., 97,

High Street, Colchester,

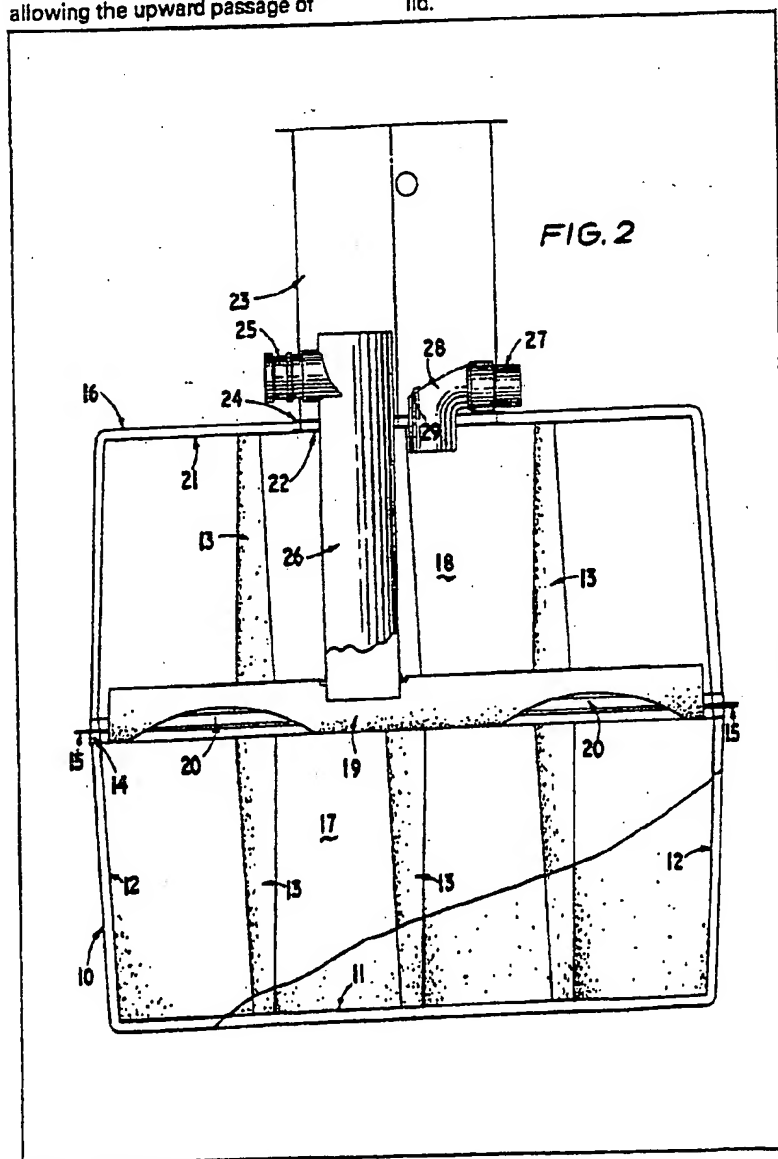
Essex CO1 1TH

(54) A moulded plastics septic tank

(57) A septic tank fabricated from plastics components which can be interfitted compactly for transport comprises a base part 10 and a similar upper part 16, both having a rectangular basal wall and upstanding side walls which flare outwardly to allow nesting for transport. An arched partition 19 is attached between the two parts 10, 16 and has cut-outs 20 allowing the upward passage of

effluent. Other components comprise an access shaft 23, an inlet pipe 25—26 extending down through the partition 19 into the interior of the base part 10, and an outlet pipe 28 extending from the interior of the upper part 16.

For transport, the upper part 16 is nested in the base part 10, and the access shaft 23 as well as the pipes 26 and 28 are stowed in the upper part. Then the partition 19 is placed over the stowed parts, to serve as a lid.



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This invention relates to a septic tank, and in particular to a septic tank fabricated from a plurality of moulded plastics material parts.

Traditionally, septic tanks have been constructed in situ using conventional building materials, but in recent years there has been a trend towards pre-fabricated septic tanks, made either of concrete or of a moulded plastics material such as polyester resin reinforced with glass-fibres. Particularly with the latter tanks, there can be significant cost advantages over on-site construction. A pre-fabricated tank is easier and quicker to install, and moreover it is possible to obtain a more reliable and leak-proof tank by fabricating at least the greater part of it under more rigorous factory conditions. The disadvantage of such prefabricated tanks is however that, though relatively light as compared to their volume, nevertheless their bulk makes them difficult to transport. Consequently, it may not be economically viable to use a pre-fabricated septic tank if the intended site is a considerable distance from the factory, because of the difficulty in transporting the tank.

It is a principal aim of the invention to provide a septic tank which can be assembled on-site from relatively few component parts pre-fabricated in a factory, which parts are easier to transport than would be a complete prefabricated septic tank of the same volumetric capacity.

According to this invention, there is provided a septic tank fabricated from moulded plastics material components and comprising a vessel made up from a base part of generally rectangular cross-section and having a basal wall with upstanding side walls which flare outwardly, an upper part of generally similar shape as the base part for connection thereto with the free edges of the side walls of the two parts mating, one of the base and upper parts being nestable in the other of the parts prior to connection of the two parts together, a partition for dividing the vessel into upper and lower chambers which partition is connected to two opposed side walls of one part in the region of the free edges of the side walls and the partition defining with the one part a plurality of apertures allowing the passage of liquid effluent from the lower chamber to the upper chamber, an access shaft of overall dimensions smaller than the internal dimensions of one of the base and upper parts and fitted to an opening in the basal wall of the upper part so as to upstand therefrom, an inlet pipe extending through a wall of the access shaft and then projecting into the lower chamber through an aperture in the partition, and an outlet pipe also extending through a wall of the access shaft and projecting into the upper chamber.

It will be appreciated that the separate tank components, prior to assembly to form a complete tank and comprising the base and upper parts, the

pipes, may all be pre-fabricated in a factory and only finally assembled to form a complete septic tank when on site. Because of the particular shape of the base and upper parts, one may nest within the other — and preferably the upper part within the base part in view of the opening in the basal wall of the upper part to which the access shaft is fitted — and then the access shaft and pipes positioned within the nested parts. Finally, the partition may be used as a lid for the nested parts with the shaft and pipes therein, ready for transport to the installation site. There, the above-mentioned components may be unpacked, and then connected together to form a fully pre-fabricated septic tank, ready for installation below ground.

It is preferred for the free edges of the side walls of both the base part and the upper part to have an outwardly-directed flange therearound, the flanges of the two parts overlapping when the tank is assembled. The flanges then be used to connect together the two parts, for instance by means of screw-threaded fasteners spaced around the length of the flanges. Such fasteners may comprise nuts and bolts extending through appropriate holes in the flanges, or studs bonded to one of the flanges and passing through holes in the other of the flanges, which studs are engaged by nuts. In either case, a water-proof gasket or a suitable mastic should be provided between the two flanges. Another possibility is to bond the two flanges together, by using a resin compatible with the plastics material from which the parts are made, or even by laying glass-fibre matting impregnated with a polyester resin over the overlapping flanges.

It is preferred for the partition to be secured to the base part, in the region of the free edges of two opposed side walls. Conveniently, this is achieved by providing a rebate internally of the base part along two opposed side walls adjacent the free edges thereof into which rebates two opposed free edges of the partition fit. The partition may be held in said rebates either by means of screw-threaded fasteners, such as have been described before, or by means of a bonded connection using an adhesive to form a permanent joint. The partition itself preferably is curved about an axis parallel to the said opposed edges of the partition and is of a length slightly shorter than the internal dimension of the base part in the region in which the partition fits, thereby providing two apertures for liquid between the ends of the partition and the adjacent end walls of the parts. Moreover, cut-outs of arcuate or other shapes may be provided along the other edges of the partition, to allow for greater liquid flow between the two chambers.

The access shaft may be of any convenient shape, though preferably it is of rounded cross-section. The access shaft may be connected to the upper part by means of an adhesive such as a polyester resin, or again may be connected to the upper part by means of screw-threaded fasteners,

such as nuts and bolts. To ensure a water-tight connection between the pipes and the side wall of the access shaft, it is preferred for the pipes to be bonded in position, though it would be possible to provide resilient grommets in the walls of the access shaft, and through which the pipes are press-fitted.

By way of example only, one specific embodiment of this invention will now be

described, reference being made to the accompanying drawings, in which: —

Figure 1 is a plan view of the septic tank of this invention;

Figure 2 is a sectional view taken on line II—II on Figure 1;

Figure 3 is a sectional view taken on line III—III on Figure 1; and

Figure 4 is a detailed view on an enlarged scale of the encircled part marked IV, on Figure 3.

Referring to the drawings, the embodiment of septic tank of this invention comprises a plurality of preformed components moulded from glass-fibre reinforced plastics material such as a polyester resin. These components include a base part 10 of generally rectangular horizontal cross-section, which part has a basal wall 11 from which upstand four side walls 12, the walls flaring outwardly as shown in Figure 2. The basal wall 11 and side walls 12 have moulded therein integral reinforcing ribs 13, and adjacent the free edges of the side walls 12 there is a rebate 14. At the free edge of each side wall, there is a flange 15 which projects horizontally outwardly away from the associated side wall.

Mounted on the base part 10 is an upper part 16, which upper part is generally similar to the base part 10 and may be manufactured in the same mould as that base part. The upper part 16 is inverted with respect to the base part 10, and is arranged so that the flanges 15 of the two parts overlap and are connected together — for example, by means of bolts (not shown), with a gasket therebetween.

Dividing the vessel formed by the connected base part 10 and upper part 16 into a lower chamber 17 and an upper chamber 18 is a partition 19, located on the rebates 14 of the two opposed long side walls 12 of the base part 10. The partition 19 extends generally from one shorter side wall to the other opposed shorter side wall, and is curved concavely with respect to the base part 10 about an axis extending parallel to the long sides. The partition 19 does however stop just short of the two shorter side walls 12 (as can be seen in Figure 2) so as to allow liquid to pass from the lower chamber 17 to the upper chamber 18; in this way the partition serves to divide the vessel into two chambers but does not prevent the passage of effluent therebetween. The partition 19 moreover has four arcuate cut-outs 20, provided two on each long side thereof, again to allow relatively free passage of effluent from the lower chamber to the upper chamber. Nuts and bolts are used to fasten the edges of the partition to the base part 10.

The top wall 21 of the upper part 16 (corresponding to the basal wall 11 of the base part 10) is provided with an aperture 22, around which is secured a parallel-sided access shaft 23, by means of nuts and bolts passing through a flange 24 provided at the lower end of the access shaft and abutting the top wall 21 around the aperture 22. The access shaft 23 has fitted thereto an inlet pipe 25, extending horizontally through a side wall of the shaft 23 and penetrating a vertical cylindrical duct 26 open at both ends and extending from just above the inlet 25 downwardly through a close-fitting orifice in the partition 19, so as to project into the lower chamber 17. The inlet pipe 25 is cut away at an angle to the axis thereof within the duct 26, as shown in Figure 2, to allow rodding through the access shaft 23 of waste pipes connected to the inlet pipe. Also mounted in the access shaft 23 but in opposition to the inlet pipe 25 is an outlet pipe 27, extending horizontally and having a right-angle bend 28 mounted thereon, to project into the upper chamber 18. The bend 28 is cut away in the region 29, to allow access for rodding pipes connected to the outlet pipe 27.

It will be appreciated that in view of the flare of the side walls of both the base parts 10 and the upper parts 16, these two parts may, following fabrication thereof but before their connection together, be nested one within the other, and preferably the upper part 16 within the base part 10 in view of the aperture 22 in the top wall 21 of the upper part 16. Moreover, the access shaft 23 is of such a size that prior to the inlet pipe 25, the duct 26 and the outlet pipe 27 being installed, this also may be stored within the confines of the side walls of the upper part 16. Either within the access shaft or generally within the confines of the side walls of the upper part 16 the duct 26, as well as the inlet pipe 25, outlet pipe 27 and bend 28 may be stored. Then the partition 19 may be placed over said stored parts, serving as a lid for the nested upper part 16. The partition 19 should be positioned so that it lies concavely, considered from the outside. In this way, the entire septic tank may be stored and transported in such condition requiring much less volume than the completed septic tank. When delivered to a site, it is a relatively easy matter to separate the nested parts and then assemble the septic tank from those component parts, firstly by bolting the partition 19 to the rebate 14 of the two long side walls 12 of the base part 10, and then bolting together the flanges 15 of the base part 10 and upper part 16, using an appropriate sealing mastic therebetween. In a similar way, the access shaft 23 is bolted to the top wall 21 of the upper part 16, whereafter the inlet and outlet pipes 25 and 27, as well as the duct 26 can then easily be assembled to complete the fabrication of the tank.

The installation of the completed septic tank as well as its manner of operation are well understood by those skilled in the art, and this will not be described here as it forms no part of this invention.

CLAIMS

1. A septic tank fabricated from moulded plastics material components and comprising a vessel made up from a base part of generally rectangular cross-section and having a basal wall with upstanding side walls which flare outwardly, an upper part of generally similar shape to the base part for connection thereto with the free edges of the side walls of the two parts mating, one of the base and upper parts being nestable in the other of the parts prior to connection of the two parts together, a partition for dividing the vessel into upper and lower chambers which partition is connected to two opposed side walls of one part in the region of the free edges of the side walls of that part and the partition defining with the one part a plurality of apertures allowing the passage of liquid effluent from the lower chamber to the upper chamber, an access shaft of overall dimensions smaller than the internal dimensions of one of the base and upper parts and fitted to an opening in the basal wall of the upper part so as to upstand therefrom, an inlet pipe extending through a wall of the access shaft and then projecting into the lower chamber through an aperture in the partition, and an outlet pipe also extending through a wall of the access shaft and projecting into the upper chamber.

2. A septic tank as claimed in claim 1, wherein the free edges of the side walls of both the base part and the upper part each have an outwardly-directed flange therearound, the flanges of the two parts overlapping when the tank is assembled.

3. A septic tank as claimed in claim 2, wherein screw-threaded fasteners clamp the two flanges together, to hold the two parts together, which fasteners are spaced around the length of the flanges.

4. A septic tank as claimed in claim 3, wherein the fasteners comprise nuts and bolts extending through appropriate holes in the flanges.

5. A septic tank as claimed in any of claims 2 to 4, wherein a water-proof gasket is provided between the two overlapping flanges.

6. A septic tank as claimed in claim 2, wherein the two overlapping flanges are bonded together by means of a resin compatible with the plastics material from which the two parts are made.

7. A septic tank as claimed in any of the preceding claims, wherein the partition is secured to the base part, in the region of the free edges of two opposed side walls.

8. A septic tank as claimed in claim 7, wherein there is a rebate provided internally of the base

part along each of two opposed side walls adjacent the free edges thereof, into which rebates two opposed free edges of the partition is fitted.

9. A septic tank as claimed in claim 8, wherein the partition is held in said rebates by means of screw-threaded fasteners spaced along the rebates.

10. A septic tank as claimed in any of the preceding claims, wherein the partition is curved about an axis generally parallel to two opposed edges of the partition and is of a length slightly shorter than the internal dimension of that part of the tank in the region thereof in which the partition fits, whereby two apertures for liquid are provided between the ends of the partition and the adjacent end walls of the said part.

11. A septic tank as claimed in any of the preceding claims, wherein the partition is provided with cut-out portions.

12. A septic tank as claimed in any of the preceding claims, wherein the access shaft is of rounded cross-section and is provided with a flange at the lower end thereof by means of which the shaft is attached to the basal wall of the upper part, around the opening therein.

13. A septic tank substantially as hereinbefore described with reference to and illustrated in the accompanying drawings.

14. A plurality of components for assembly into a septic tank as claimed in claim 1, which components comprise a base part of generally rectangular cross-section and having a basal wall with upstanding side walls which flare outwardly, an upper part of generally similar shape to the base part and nested therewithin, the basal wall of the upper part having an opening therewithin for an access shaft which shaft is positioned within the upper part and is adapted for attachment thereto so as to upstand from the basal wall whilst communicating with the opening therewithin, inlet and outlet pipes also positioned within the confines of the upper part and adapted for assembly with the access shaft respectively to allow the supply of effluent to and removal of effluent from the assembled tank, and a partition for the assembled tank which partition is adapted for attachment to one of the two parts to divide the assembled two parts into upper and lower chambers, the partition being fitted over the nested parts to serve as a lid for the nested upper part to restrain removal of the access shaft and pipes therefrom.